Online Appendix

The Impact of Financial Assistance Programs on Healthcare Utilization: Evidence from Kaiser Permanente

Alyce Adams, Raymond Kluender, Neale Mahoney, Jinglin Wang, Francis Wong, and Wesley Yin

A. Hospital Financial Assistance Programs

We focus on the 40 largest health systems by number of hospitals as of July 2019, compiled by Becker's Hospital Review (`www.beckershospitalreview.com/largest-hospitals-and-health-systems-in-america-2019`). To determine whether a health system has a financial assistance program, we search on the health system's organization website using keywords such as financial assistance and charity care. For eligibility criteria and benefits, we refer to the most recent financial assistance/charity care policy documents available on the organization's website. We record only income-based eligibility criteria and use the organization's own language to describe the benefits (with small modifications for succinctness). To determine whether a health system is not-for-profit, we refer primarily to the organization's website (or other sources found via internet search if such information is not available on the organization's website).

B. Manipulation Tests

Appendix Table A2 reports results from manipulation tests of the density of applicants around the 350% FPL threshold. For reference, the first column reports the coefficient on an indicator for income less than the 350% FPL threshold from the first stage regression (equation 2). The second column reports results from the manipulation test proposed by Cattaneo, Jansson and Ma (2020, henceforth CJM) using the recommended second-order polynomial with bandwidths of 31.05 pp and 39.30 pp below and above the discontinuity, respectively. The p-value for the test statistic of 0.202 fails to reject the null of no manipulation. The third column reports results from the manipulation test proposed in McCrary (2008) using the recommended bin size (1.04 pp) and bandwidth (81.14 pp). The p-value of for this test rejects the null of no manipulation.

Because the result of the McCrary test conflicts with that from CJM, and because excess mass below the cutoff is not evident in visual inspection of the density (Figure 1), we assess the performance of both methods by implementing these tests at placebo thresholds throughout the distribution of income in our sample (i.e., at various points that do not correspond to any relevant program cutoff). Our baseline sample is comprised of applicants with an income of +/- 200% FPL around the 350% FPL threshold. We construct placebo thresholds at 1% intervals for the 301 points between 200% of FPL and 500% of FPL, and implement the CJM and McCrary tests on samples restricted to applicants +/- 200%

FPL from these placebo cutoffs. As we do above, we use the recommended bin sizes and bandwidths for all of these exercises.

Appendix Figure A3 plots the resulting p-values of the test statistics against the placebo thresholds from this exercise. The CJM test (Panel A) is moderately prone to over-rejecting the null of no manipulation, with p-values of less than 0.05 for 16.6% of placebo thresholds. In comparison, the McCrary test (Panel B) is much more biased towards over-rejection, rejecting the null with a p-value below 0.05 in 40.5% for placebo thresholds. Based on this simulation, we conclude that the McCrary test is not well-suited to our environment. We view the fact that the CJM moderately over-rejects on average but fails to reject at the true 350% threshold as fairly strong evidence in support of the research design.

Table A1—Financial Assistance Policies

Rank	Health System	Number of Hospitals	Program eligibility	Benefit
1	HCA Healthcare	185	Income $<$ 200% FPL	100% write-off of costs related to emergency services
			Income between 200 and 400% FPL	Out-of-pocket balances are capped at 4% of annual income using a sliding scale.
2	Ascension Health	151	Income $\leq$ 250% FPL	100% discount off patient responsibility amounts
			Income between 250 and 350% FPL	75% discount off patient responsibility amounts
			Income between 351 and 400% FPL	67% discount off patient responsibility amounts
4	Community Health Systems	142	Income $<$ 200% FPL	Receive care for free
			Income between 201% and 301% FPL	Receive care discounted to the amount generally billed to Medicare patients for such services.
5	Trinity Health	92	Income $<$ 250% FPL	100% discount on patient financial obligations
7	Tenet Healthcare	65	Income below 200% FPL	100% charity care discount
9	Providence Health	51	Income $\leq$ 300% FPL	100% write-off on patient responsibility amounts
			Income between 301 and 350% FPL	75% discount from original charges on patient responsibility amounts
10	Atrium Health	50	Income $\leq$ 200% of FPL	100% discount on eligible services for 180 days
			Income between 201 and 300% FPL	75% discount on eligible services for 180 days
			Income between 301 and 400% FPL	50% discount on eligible services for 180 days
11	AdventHealth	50	Income $\leq$ 200% FPL	100% write-off of medical bills
12	Baylor Scott & White Health	48	Income $<$ 200% FPL	100% discount on outstanding patient account balances
			Income between 200 and 500% FPL	Patient owes the lesser of the patient's account balance or 10% of the patient's gross charges no greater than the Amount Generally Billed
13	Bon Secours Mercy Health	48	Income $\leq$ 200% FPL	100% financial assistance
			Income between 201 and 400% FPL	Receive discounted care based on a sliding scale on a regional basis
15	Sanford Health	44	Income $\leq$ 225% FPL	Complete forgiveness of patient due balance
			Income between 226 and 375% FPL	Partial reduction of the amount of the balance outstanding such that the remaining balance will be no greater than the amount generally billed
16	Mercy	41	Income $<$ 200% FPL	100% hospital and physician discount
			Income between 201-250%	80% hospital discount and 70% physician discount
			Income between 251-300%	74% hospital discount and 50% physician discount
17	UPMC	40	Income $<$ 250% FPL	Receive 100% discounted charity care

Continued on next page

Table A1 – *Continued from previous page*

Rank	Health System	Number of Hospitals	Program eligibility	Benefit
			Income between 251-300%	Receive care at 80% discount rate
			Income between 301-400%	Receive care at 70% discount rate
18	Kaiser Permanente	39	Income $\leq$ 350% FPL	100% discount on patient responsibility; may also include an eligibility period for follow up services
19	MercyOne	39	Income $\leq$ 350% FPL	Free care for medically-necessary services
21	Christus Health	35	Income below 300% FPL	100% charity care discount off patient responsibility amounts
			Income between 300% and 401% FPL	Patient gross charges capped at the Amount Generally Billed to Medicare
22	Avera Health	33	Income below 150% FPL	100% forgiveness of charges for emergent or medically necessary care
			Income between 150% and 400% FPL	Up to 90% forgiveness of charges for emergent or medically necessary care based on a sliding scale
24	Great Plains Health Alliance	29	Income $\leq$ 250% FPL	Full write-off of charges
			Income between 251% and 450% FPL	Up to 75% forgiveness of charges based on a sliding scale
25	Texas Health Resources	29	Income $\leq$ 200% FPL	Discount equal to the due balance less any amount the patient is deemed able to pay
26	Advocate Aurora Health	28	Income $\leq$ 250% FPL	100% financial assistance adjustment on patient responsibility amount
			Income between 250% and 600% FPL	Partial financial assistance adjustment
27	Banner Health	28	Income $<$ 200% FPL	100% discount off patient account for uninsured patients or balance after insurance in excess of $2500 for insured patients
			Income between 200% and 300% FPL	75% discount off AGB for uninsured patients or balance after insurance in excess of $2500 for insured patients
			Income between 300% and 400% FPL	50% discount off AGB for uninsured patients or balance after insurance in excess of $2500 for insured patients
30	Universal Health Services	26	Income $<$ 200% FPL	100% discount off gross charges
			Income between 201% and 250% FPL	83.5% discount off gross charges
			Income between 251% and 300% FPL	67% discount off gross charges
31	Intermountain Healthcare	24	Income below 200% FPL	Full assistance, minus a nominal patient responsibility per episode of care
			Income between 200% and 500% FPL	Partial financial assistance based on a sliding scale
32	Sutter Health	24	Income $<$ 400% FPL	Full charity care
34	Mayo Clinic Health System	23	Income $<$ 200% FPL	100% adjustment of the self-pay balance
			Income between 200% and 400% FPL	50% adjustment of the self-pay balance
35	Northwell Health	23	Income below 100% FPL	Full financial assistance

Continued on next page

Table A1 – *Continued from previous page*

Rank	Health System	Number of Hospitals	Program eligibility	Benefit
			Income between 101% and 500% FPL	Partial Financial Assistance with the amount billable to the patient capped at the Amount Generally Billed to insured persons
36	SSM Health	23	Income $<$ 200% FPL	100% financial assistance discount
			Income between 201% and 400% FPL	Partial financial assistance based on a sliding scale
37	Baptist	22	Income $<$ 200% FPL	100% financial assistance discount
			Income between 201 and 400% FPL	Partial financial assistance based on a sliding scale
			Income $>$ 400% FPL	Varies by facility
38	UnityPoint Health	22	Income $<$ 200% FPL	100% discount
			Income between 201 and 400% FPL	Partial discount off the Amount Generally Billed to insured patients based on a sliding scale
			Income between 401 and 600% FPL	Amount Generally Billed to insured patients only
39	Ballad Health	21	Income $<$ 225% FPL	100% financial assistance
			Income between 225% and 450% FPL	Partial discount on Amount Generally Billed charges based on a sliding scale
40	Hospital Sisters Health System	15	Income $<$ 200% FPL	100% discount off patient account
			Income between 201% FPL and 400% FPL (Wisconsin) or 600% FPL (Illinois)	Partial discount off patient account based on a sliding scale

Note: See Appendix Section A for details on the construction of this table.

Table A2—First Stage and Manipulation Tests

	First Stage	CJM Test	McCrary Test
Coef.	0.7876	0.0003	0.4318
Std. Err.	0.0169	0.0002	0.0749
Test Statistic	46.6977	1.2767	5.7627
P-value	0.0000	0.2017	0.0000
Obs.	18672	18672	18672

Note: Column 1 reports the coefficient on an indicator for income less than the 350% FPL threshold from the first stage regression (equation 2). Column 2 reports results from the Cattaneo, Jansson, and Ma (2020) manipulation test using the recommend second-order polynomial with bandwidths of 31.05 pp and 39.30 pp below and above the discontinuity, respectively. Coef. is the difference between the local quadratic density estimators to either side of the cutoff; Test Statistic is the t-score. Column 3 reports results from a McCrary (2008) manipulation test using the recommended bin size (1.04 pp) and bandwidth (81.14 pp).

Table A3—RD Estimates, Alternative Specifications

		Reduced Form			Instrumental Variables		
	Control Mean	Coef (SE)	95% CI	P-value	Coef (SE)	95% CI	P-value
Panel A. Separate Polynomials on Either Side of Cutoff							
Any Ambulatory Encounter	0.670	0.115	[0.052, 0.178]	0.000	0.146	[0.066, 0.226]	0.000
		(0.032)			(0.041)		
Any Inpatient Encounter	0.062	0.033	[-0.000, 0.067]	0.052	0.042	[-0.000, 0.085]	0.052
		(0.017)			(0.022)		
Any Emergency Department Encounter	0.127	0.065	[0.020, 0.110]	0.005	0.083	[0.025, 0.141]	0.005
		(0.023)			(0.030)		
Any Encounter (Ambulatory, Inpatient, or ED)	0.684	0.116	[0.054, 0.179]	0.000	0.148	[0.069, 0.227]	0.000
		(0.032)			(0.040)		
Prescription Drug Days Supplied[a]	131.203	35.255	[13.416,57.095]	0.002	44.807	[16.723,72.891]	0.002
		(11.142)			(14.329)		
Any Lab Test	0.194	0.064	[0.011, 0.117]	0.018	0.081	[0.014, 0.149]	0.018
		(0.027)			(0.034)		
Any Abnormal Test Result (Unconditional)	0.106	0.040	[-0.001, 0.080]	0.054	0.050	[-0.001, 0.102]	0.055
		(0.021)			(0.026)		
Any Abnormal Test Result (Conditional on Test)	0.544	0.040	[-0.114, 0.194]	0.611	0.049	[-0.141, 0.240]	0.612
		(0.078)			(0.097)		
Panel B. Locally Linear Polynomials on Either Side of Cutoff							
Any Ambulatory Encounter	0.670	0.091	[-0.010, 0.191]	0.077	0.118	[0.003, 0.233]	0.044
		(0.051)			(0.059)		
Any Inpatient Encounter	0.062	0.023	[-0.034, 0.080]	0.427	0.031	[-0.041, 0.102]	0.403
		(0.029)			(0.037)		
Any Emergency Department Encounter	0.127	0.057	[-0.017, 0.130]	0.132	0.069	[-0.027, 0.165]	0.158
		(0.038)			(0.049)		
Any Encounter (Ambulatory, Inpatient, or ED)	0.684	0.103	[0.009, 0.197]	0.031	0.131	[0.019, 0.243]	0.022
		(0.048)			(0.057)		
Prescription Drug Days Supplied[a]	131.203	1.442	[-35.936,38.821]	0.940	18.397	[-24.848,61.642]	0.404
		(19.071)			(22.064)		
Any Lab Test	0.194	0.079	[-0.007, 0.166]	0.072	0.103	[-0.009, 0.215]	0.071
		(0.044)			(0.057)		
Any Abnormal Test Result (Unconditional)	0.106	0.018	[-0.047, 0.082]	0.588	0.041	[-0.028, 0.110]	0.242
		(0.033)			(0.035)		
Any Abnormal Test Result (Conditional on Test)	0.544	-0.060	[-0.278, 0.157]	0.587	-0.112	[-0.406, 0.182]	0.456
		(0.111)			(0.150)		
Panel C. Donut RD							
Any Ambulatory Encounter	0.678	0.105	[0.054, 0.157]	0.000	0.133	[0.067, 0.199]	0.000
		(0.026)			(0.033)		
Any Inpatient Encounter	0.058	0.036	[0.009, 0.063]	0.008	0.046	[0.012, 0.080]	0.008
		(0.014)			(0.017)		
Any Emergency Department Encounter	0.128	0.054	[0.015, 0.092]	0.006	0.068	[0.019, 0.117]	0.007
		(0.020)			(0.025)		
Any Encounter (Ambulatory, Inpatient, or ED)	0.693	0.097	[0.046, 0.148]	0.000	0.123	[0.058, 0.188]	0.000
		(0.026)			(0.033)		
Prescription Drug Days Supplied[a]	136.203	21.482	[2.283,40.682]	0.028	27.123	[2.786,51.460]	0.029
		(9.795)			(12.417)		
Any Lab Test	0.200	0.054	[0.008, 0.100]	0.022	0.068	[0.010, 0.126]	0.022
		(0.023)			(0.030)		
Any Abnormal Test Result (Unconditional)	0.112	0.024	[-0.012, 0.060]	0.188	0.030	[-0.015, 0.076]	0.189
		(0.018)			(0.023)		
Any Abnormal Test Result (Conditional on Test)	0.560	-0.025	[-0.147, 0.097]	0.682	-0.030	[-0.172, 0.113]	0.682
		(0.062)			(0.073)		
Panel D. Count Outcomes							
Number of Ambulatory Encounters[a]	3.813	0.516	[0.038, 0.994]	0.034	0.655	[0.047, 1.264]	0.035
		(0.244)			(0.310)		
Number of Inpatient Encounters[a]	0.062	0.029	[0.004, 0.053]	0.021	0.036	[0.006, 0.067]	0.021
		(0.012)			(0.016)		
Number of Emergency Department Encounters[a]	0.166	0.073	[0.027, 0.120]	0.002	0.093	[0.034, 0.152]	0.002
		(0.024)			(0.030)		
Total Number of Encounters (Ambulatory, Inpatient, ED)[a]	4.129	0.636	[0.113, 1.159]	0.017	0.807	[0.142, 1.473]	0.017
		(0.267)			(0.340)		

Note: Table reports alternative specifications of the regression discontinuity estimates for quarter 1 with standard errors in parentheses. Panel A reports estimates that control for separate second-order polynomials in income on either side of the threshold. Panel B shows estimates that control for local linear polynomials using the optimal bandwidth proposed by Calonico et. al (2014). Panel C reports estimates that control for a global second-order polynomial, as we do in our baseline specification, but excludes applicants with incomes $\pm$ 10% FPL from the cutoff (340-360% FPL). Panel D shows estimates that control for a global second-order polynomial, as we do in our baseline specification, but with count outcomes as the dependent variables. [a]Winsorized at the 95th percentile. Control mean is the mean for applicants with incomes between 350% and 450% of FPL. N = 18,672 observations.

Table A4—RD Estimates for Quarter 1, Clinical Outcomes

		Reduced Form			Instrumental Variables		
	Control Mean	Coef (SE)	95% CI	P-value	Coef (SE)	95% CI	P-value
A. Cholesterol							
Abnormal Cholesterol[a]	0.027	0.021 (0.008)	[0.006, 0.036]	0.007	0.026 (0.010)	[0.007, 0.046]	0.007
Any Abnormal Cholesterol Drugs	0.262	0.038 (0.022)	[-0.004, 0.081]	0.079	0.049 (0.028)	[-0.006, 0.103]	0.080
Days Supplied for Abnormal Cholesterol Drugs[b]	24.874	3.353 (2.077)	[-0.717, 7.423]	0.106	4.257 (2.642)	[-0.922, 9.436]	0.107
B. Diabetes							
A1C Level $\geq$ 6.5	0.075	0.007 (0.013)	[-0.019, 0.033]	0.581	0.009 (0.017)	[-0.024, 0.043]	0.581
Any Diabetes Drugs	0.141	0.029 (0.017)	[-0.004, 0.063]	0.087	0.037 (0.022)	[-0.005, 0.080]	0.087
Days Supplied for Diabetes Drugs[b]	18.437	5.146 (2.477)	[0.290,10.002]	0.038	6.533 (3.150)	[0.359,12.708]	0.038
C. Depression							
Any Antidepressants	0.149	0.044 (0.018)	[0.008, 0.079]	0.015	0.055 (0.023)	[0.011, 0.100]	0.016
Days Supplied for Antidepressants[b]	14.211	3.793 (1.776)	[0.311, 7.275]	0.033	4.816 (2.261)	[0.384, 9.248]	0.033
D. Blood Pressure							
Any Blood Pressure Drugs	0.398	0.030 (0.024)	[-0.018, 0.077]	0.219	0.038 (0.031)	[-0.023, 0.098]	0.220
Days Supplied for Blood Pressure Drugs[b]	66.062	9.691 (4.762)	[0.358,19.025]	0.042	12.305 (6.069)	[0.410,24.199]	0.043

Note: Table reports regression discontinuity estimates for quarter 1 with standard errors in parentheses. [a]Abnormal Cholesterol is defined as having either high total cholesterol or low HDL test results at any point in the given quarter. A high total cholesterol level is defined as 240 mg per deciliter or higher for adults (age 18+) and 170 mg per deciliter or higher for non-adults. A low HDL cholesterol level is defined as less than 40 mg per deciliter for adults or less than 45 mg per deciliter for non-adults. [b]Winsorized at the 95th percentile. Control mean is the mean for applicants with incomes between 350% and 450% of FPL. N = 18,672 observations.

Table A5—RD Estimates for Each Quarter

	Ambulatory		Inpatient		ED		Any Encounter		RX		Any Lab		Unconditional Lab		Conditional Lab	
Quarter	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value
-7	0.026	0.295	-0.005	0.454	-0.016	0.223	0.023	0.352	7.531	0.331	0.009	0.627	0.018	0.244	0.071	0.225
	(0.025)		(0.007)		(0.013)		(0.025)		(7.752)		(0.019)		(0.015)		(0.059)	
-6	0.012	0.640	-0.005	0.559	0.004	0.726	0.010	0.676	-0.931	0.906	0.000	0.989	0.011	0.475	0.055	0.320
	(0.025)		(0.008)		(0.012)		(0.025)		(7.879)		(0.019)		(0.016)		(0.055)	
-5	0.011	0.672	-0.009	0.199	-0.007	0.584	0.011	0.668	5.656	0.464	0.011	0.553	0.010	0.494	0.024	0.693
	(0.025)		(0.007)		(0.013)		(0.025)		(7.722)		(0.019)		(0.015)		(0.060)	
-4	0.021	0.392	-0.002	0.782	0.025	0.061	0.028	0.264	-2.414	0.758	-0.001	0.972	-0.002	0.896	-0.008	0.887
	(0.025)		(0.008)		(0.013)		(0.025)		(7.841)		(0.019)		(0.015)		(0.057)	
-3	0.023	0.342	0.006	0.459	0.001	0.928	0.022	0.375	3.392	0.670	-0.007	0.731	0.002	0.903	0.028	0.613
	(0.025)		(0.009)		(0.014)		(0.025)		(7.968)		(0.020)		(0.016)		(0.055)	
-2	0.015	0.532	0.013	0.166	0.016	0.291	0.009	0.701	1.023	0.898	0.015	0.444	0.008	0.632	-0.006	0.918
	(0.024)		(0.009)		(0.015)		(0.024)		(8.000)		(0.020)		(0.016)		(0.054)	
-1	-0.002	0.925	-0.001	0.918	0.015	0.375	-0.002	0.930	-3.774	0.643	-0.023	0.260	-0.005	0.768	0.035	0.508
	(0.023)		(0.013)		(0.017)		(0.023)		(8.151)		(0.021)		(0.016)		(0.052)	
0	0.033	0.110	0.020	0.331	0.062	0.004	0.031	0.126	5.605	0.502	-0.004	0.855	0.009	0.614	0.039	0.385
	(0.021)		(0.020)		(0.022)		(0.020)		(8.345)		(0.023)		(0.019)		(0.045)	
1	0.106	0.000	0.029	0.021	0.053	0.002	0.102	0.000	21.674	0.009	0.056	0.005	0.027	0.082	-0.018	0.743
	(0.023)		(0.012)		(0.017)		(0.023)		(8.299)		(0.020)		(0.015)		(0.055)	
2	0.037	0.121	0.013	0.198	0.021	0.196	0.036	0.123	14.639	0.076	0.027	0.176	0.017	0.293	0.010	0.856
	(0.024)		(0.010)		(0.016)		(0.024)		(8.254)		(0.020)		(0.016)		(0.055)	
3	0.009	0.697	-0.005	0.655	0.027	0.084	0.016	0.510	10.884	0.190	-0.021	0.293	0.003	0.840	0.076	0.169
	(0.024)		(0.010)		(0.016)		(0.024)		(8.304)		(0.020)		(0.016)		(0.055)	
4	0.006	0.812	0.006	0.491	0.019	0.217	0.011	0.640	12.518	0.120	-0.015	0.466	0.011	0.505	0.090	0.094
	(0.024)		(0.009)		(0.015)		(0.024)		(8.047)		(0.020)		(0.016)		(0.054)	
5	-0.004	0.858	0.001	0.867	0.020	0.192	-0.002	0.934	9.175	0.258	-0.006	0.756	-0.000	0.979	0.016	0.772
	(0.024)		(0.008)		(0.015)		(0.024)		(8.108)		(0.020)		(0.016)		(0.054)	
6	0.043	0.082	0.010	0.225	0.031	0.033	0.050	0.042	18.373	0.022	0.040	0.043	0.028	0.058	0.037	0.515
	(0.025)		(0.009)		(0.014)		(0.024)		(8.013)		(0.020)		(0.015)		(0.056)	
7	-0.018	0.475	0.012	0.182	0.019	0.205	-0.010	0.682	12.968	0.100	0.012	0.546	0.017	0.295	0.044	0.409
	(0.025)		(0.009)		(0.015)		(0.024)		(7.883)		(0.020)		(0.016)		(0.053)	
8	0.031	0.211	0.001	0.918	0.010	0.461	0.036	0.144	4.797	0.514	-0.014	0.459	0.000	0.996	0.042	0.463
	(0.025)		(0.007)		(0.014)		(0.025)		(7.348)		(0.019)		(0.015)		(0.058)	

Note: Table reports regression discontinuity estimates for each quarter with standard errors in parentheses. Quarter 0 corresponds to event months 0, -1, and -2 relative to the month of application decision. Ambulatory = Any ambulatory encounter. Inpatient = Any inpatient encounter. ED = Any emergency department encounter. Any Encounter = Any ambulatory, inpatient, or ED encounter. RX = Prescription drug days supplied (winsorized at the 95th percentile). Any Lab = Any lab test record. Unconditional Lab = Any abnormal lab result unconditional on having a lab record. Conditional Lab = Any abnormal lab result conditional on having a lab record. Estimates for each quarter are based on regressions with N = 18,672 observations.

Table A6—IV Estimates for Each Quarter

	Ambulatory		Inpatient		ED		Any Encounter		RX		Any Lab		Unconditional Lab		Conditional Lab	
Quarter	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value	Coef	P Value
-7	0.033	0.296	-0.006	0.454	-0.020	0.223	0.029	0.353	9.562	0.332	0.011	0.627	0.022	0.244	0.081	0.223
	(0.032)		(0.008)		(0.016)		(0.032)		(9.862)		(0.024)		(0.019)		(0.066)	
-6	0.015	0.641	-0.006	0.559	0.005	0.726	0.013	0.676	-1.181	0.906	0.000	0.989	0.015	0.475	0.066	0.317
	(0.032)		(0.010)		(0.015)		(0.031)		(10.001)		(0.025)		(0.020)		(0.066)	
-5	0.013	0.672	-0.012	0.199	-0.009	0.584	0.013	0.668	7.181	0.464	0.014	0.553	0.013	0.494	0.028	0.692
	(0.031)		(0.009)		(0.017)		(0.031)		(9.815)		(0.024)		(0.019)		(0.070)	
-4	0.027	0.392	-0.003	0.782	0.032	0.061	0.035	0.265	-3.065	0.758	-0.001	0.972	-0.003	0.896	-0.010	0.887
	(0.031)		(0.010)		(0.017)		(0.031)		(9.950)		(0.024)		(0.020)		(0.069)	
-3	0.030	0.343	0.008	0.459	0.002	0.928	0.028	0.375	4.307	0.670	-0.009	0.731	0.002	0.903	0.036	0.613
	(0.031)		(0.011)		(0.018)		(0.031)		(10.121)		(0.025)		(0.020)		(0.072)	
-2	0.019	0.532	0.016	0.167	0.021	0.291	0.012	0.701	1.299	0.898	0.019	0.444	0.010	0.632	-0.007	0.918
	(0.031)		(0.012)		(0.020)		(0.030)		(10.157)		(0.025)		(0.020)		(0.064)	
-1	-0.003	0.925	-0.002	0.918	0.019	0.374	-0.003	0.930	-4.791	0.643	-0.030	0.260	-0.006	0.768	0.045	0.508
	(0.030)		(0.016)		(0.021)		(0.029)		(10.343)		(0.026)		(0.021)		(0.068)	
0	0.042	0.110	0.025	0.331	0.079	0.004	0.039	0.126	7.116	0.502	-0.005	0.855	0.012	0.614	0.048	0.383
	(0.026)		(0.026)		(0.027)		(0.025)		(10.600)		(0.029)		(0.024)		(0.055)	
1	0.134	0.000	0.036	0.021	0.067	0.002	0.130	0.000	27.519	0.009	0.071	0.005	0.034	0.082	-0.022	0.742
	(0.029)		(0.016)		(0.022)		(0.029)		(10.589)		(0.025)		(0.019)		(0.066)	
2	0.047	0.121	0.017	0.199	0.027	0.196	0.046	0.123	18.587	0.077	0.034	0.176	0.021	0.293	0.012	0.856
	(0.030)		(0.013)		(0.020)		(0.030)		(10.503)		(0.025)		(0.020)		(0.064)	
3	0.012	0.697	-0.006	0.655	0.034	0.085	0.020	0.510	13.819	0.191	-0.027	0.294	0.004	0.840	0.102	0.170
	(0.031)		(0.013)		(0.020)		(0.030)		(10.561)		(0.025)		(0.020)		(0.074)	
4	0.007	0.812	0.008	0.491	0.024	0.217	0.014	0.640	15.894	0.120	-0.019	0.466	0.013	0.505	0.113	0.094
	(0.031)		(0.011)		(0.019)		(0.031)		(10.225)		(0.026)		(0.020)		(0.068)	
5	-0.006	0.858	0.002	0.867	0.025	0.192	-0.003	0.934	11.649	0.258	-0.008	0.756	-0.001	0.979	0.019	0.772
	(0.031)		(0.011)		(0.019)		(0.031)		(10.304)		(0.025)		(0.020)		(0.067)	
6	0.054	0.083	0.013	0.225	0.039	0.033	0.063	0.042	23.328	0.022	0.051	0.043	0.036	0.058	0.045	0.514
	(0.031)		(0.011)		(0.018)		(0.031)		(10.212)		(0.025)		(0.019)		(0.069)	
7	-0.022	0.475	0.015	0.182	0.024	0.205	-0.013	0.682	16.465	0.101	0.016	0.546	0.021	0.296	0.056	0.409
	(0.031)		(0.011)		(0.019)		(0.031)		(10.025)		(0.026)		(0.021)		(0.067)	
8	0.039	0.211	0.001	0.918	0.013	0.461	0.046	0.144	6.090	0.514	-0.018	0.459	0.000	0.996	0.056	0.461
	(0.031)		(0.009)		(0.018)		(0.031)		(9.331)		(0.024)		(0.019)		(0.076)	

Note: Table reports IV estimates for each quarter with standard errors in parentheses. Quarter 0 corresponds to event months 0, -1, and -2 relative to the month of application decision. Ambulatory = Any ambulatory encounter. Inpatient = Any inpatient encounter. ED = Any emergency department encounter. Any Encounter = Any encounter including ambulatory, inpatient, or ED. RX = Prescription drug days supplied (winsorized at the 95th percentile). Any Lab = Any lab test record. Unconditional Lab = Any abnormal lab results unconditional on having a lab record. Conditional Lab = Any abnormal lab results conditional on having a lab record. Estimates for each quarter are based on regressions with N = 18,672 observations.

Table A7—Proportional Effects for Each Quarter

	Ambulatory		Inpatient		ED		Any Encounter		RX		Any Lab		Unconditional Lab		Conditional Lab	
Quarter	Control Mean	Effect	Control Mean	Effect	Control Mean	Effect	Control Mean	Effect	Control Mean	Effect	Control Mean	Effect	Control Mean	Effect	Control Mean	Effect
-7	0.499	0.066	0.021	-0.300	0.081	-0.244	0.509	0.058	111.101	0.086	0.172	0.067	0.101	0.220	0.589	0.137
		(0.063)		(0.400)		(0.200)		(0.062)		(0.089)		(0.138)		(0.189)		(0.113)
-6	0.526	0.028	0.029	-0.202	0.071	0.076	0.534	0.025	115.878	-0.010	0.186	0.002	0.110	0.132	0.590	0.112
		(0.060)		(0.346)		(0.217)		(0.059)		(0.086)		(0.133)		(0.185)		(0.112)
-5	0.525	0.025	0.021	-0.557	0.078	-0.117	0.535	0.025	112.532	0.064	0.175	0.080	0.103	0.125	0.587	0.047
		(0.060)		(0.434)		(0.214)		(0.059)		(0.087)		(0.134)		(0.182)		(0.120)
-4	0.545	0.049	0.025	-0.112	0.076	0.414	0.552	0.063	118.778	-0.026	0.193	-0.004	0.113	-0.023	0.589	-0.017
		(0.058)		(0.404)		(0.221)		(0.057)		(0.084)		(0.127)		(0.173)		(0.117)
-3	0.573	0.052	0.034	0.237	0.091	0.018	0.582	0.047	120.240	0.036	0.204	-0.042	0.111	0.022	0.542	0.067
		(0.054)		(0.320)		(0.203)		(0.053)		(0.084)		(0.123)		(0.182)		(0.133)
-2	0.620	0.031	0.035	0.458	0.102	0.202	0.633	0.018	125.023	0.010	0.203	0.096	0.114	0.085	0.563	-0.012
		(0.049)		(0.331)		(0.192)		(0.048)		(0.081)		(0.125)		(0.178)		(0.114)
-1	0.678	-0.004	0.077	-0.022	0.140	0.134	0.691	-0.004	132.601	-0.036	0.240	-0.123	0.129	-0.047	0.536	0.084
		(0.044)		(0.211)		(0.151)		(0.043)		(0.078)		(0.109)		(0.160)		(0.127)
0	0.766	0.055	0.207	0.121	0.236	0.334	0.787	0.049	138.873	0.051	0.293	-0.018	0.158	0.076	0.541	0.089
		(0.034)		(0.124)		(0.116)		(0.032)		(0.076)		(0.099)		(0.150)		(0.102)
1	0.670	0.200	0.062	0.588	0.127	0.531	0.684	0.190	131.203	0.210	0.194	0.367	0.106	0.319	0.544	-0.040
		(0.044)		(0.254)		(0.171)		(0.042)		(0.081)		(0.131)		(0.184)		(0.122)
2	0.643	0.073	0.044	0.387	0.123	0.216	0.656	0.071	128.221	0.145	0.205	0.167	0.116	0.181	0.567	0.021
		(0.047)		(0.301)		(0.167)		(0.046)		(0.082)		(0.124)		(0.173)		(0.113)
3	0.633	0.019	0.045	-0.129	0.105	0.329	0.639	0.031	126.549	0.109	0.207	-0.129	0.114	0.035	0.553	0.184
		(0.048)		(0.288)		(0.191)		(0.048)		(0.083)		(0.123)		(0.174)		(0.134)
4	0.616	0.012	0.032	0.240	0.110	0.215	0.628	0.023	123.178	0.129	0.219	-0.086	0.112	0.119	0.513	0.221
		(0.050)		(0.348)		(0.174)		(0.049)		(0.083)		(0.118)		(0.179)		(0.132)
5	0.588	-0.009	0.028	0.065	0.104	0.240	0.598	-0.004	121.696	0.096	0.212	-0.037	0.122	-0.004	0.577	0.034
		(0.053)		(0.389)		(0.184)		(0.052)		(0.085)		(0.120)		(0.166)		(0.116)
6	0.562	0.096	0.031	0.437	0.092	0.424	0.570	0.111	114.252	0.204	0.185	0.273	0.093	0.387	0.505	0.090
		(0.056)		(0.360)		(0.198)		(0.055)		(0.089)		(0.135)		(0.204)		(0.137)
7	0.588	-0.038	0.033	0.444	0.100	0.235	0.592	-0.022	114.321	0.144	0.208	0.075	0.116	0.185	0.560	0.099
		(0.053)		(0.333)		(0.186)		(0.052)		(0.088)		(0.124)		(0.177)		(0.120)
8	0.524	0.075	0.024	0.039	0.082	0.158	0.530	0.087	103.691	0.059	0.192	-0.094	0.101	0.001	0.527	0.106
		(0.060)		(0.376)		(0.214)		(0.059)		(0.090)		(0.127)		(0.187)		(0.144)

Note: Table reports control group mean (mean outcome for those with income 350-450% FPL) and proportional effects for each quarter (IV estimates divided by control group means) with proportional standard errors (standard errors divided by control group means) in parentheses. Quarter 0 corresponds to event months 0, -1, and -2 relative to the month of application decision. Ambulatory = Any ambulatory encounter. Inpatient = Any inpatient encounter. ED = Any emergency department encounter. Any Encounter = Any encounter including ambulatory, inpatient, or ED. RX = Prescription drug days supplied (winsorized at the 95th percentile). Any Lab = Any lab test record. Unconditional Lab = Any abnormal lab results unconditional on having a lab record. Conditional Lab = Any abnormal lab results conditional on having a lab record. Estimates for each quarter are based on regressions with N = 18,672 observations.

Table A8—Proportional Effect Comparison with Oregon Health Insurance Experiment

Kaiser Medical Financial Assistance Program				Oregon Health Insurance Experiment			
Outcome	Q1 RD estimate (IV)	Q1 mean value in control group (350-450% FPL)	Proportional effect	Outcome	Effect (LATE)	Mean value in control group	Proportional effect
Any Ambulatory Encounter	13.4%	67.0%	20.0%	Any Outpatient Visits[a]	21.20%	57.4%	36.9%
Any Inpatient Encounter	3.6%	6.2%	58.8%	Any Inpatient Hospital Admissions[a]	0.77%	7.2%	10.7%
Any Emergency Department Encounter	6.7%	12.7%	53.1%	Any Emergency Department Department Visits[b]	7.0%	34.5%	20.3%
Prescription Drug Days Supplied	27.5	131.2	21.0%	Number of Current Prescription Drugs[a]	2.3	0.3	15.0%

[a]Source: Table V, Finkelstein et al. (2012). Outcome measures are from survey responses (with a 6-month look-back period for outpatient visits and inpatient admissions), where the average survey response occurs about 15 months after notification date.

[b]Source: Table 2, Taubman et al. (2014). Outcome measure is from administrative data over an 18-month study period.

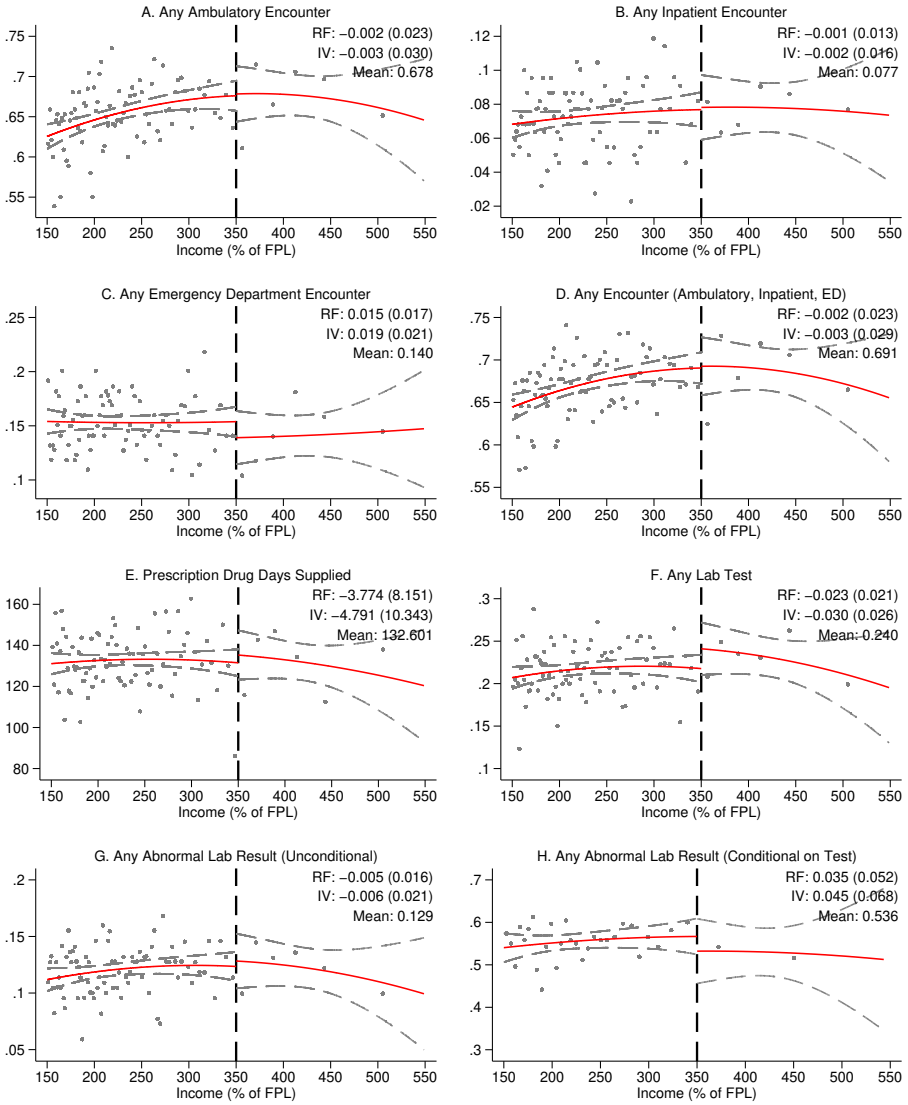

Figure A1. RD Estimates for Quarter -1

Note: Figure shows regression discontinuity plots of the impact of financial assistance in quarter -1, which corresponds to event months -3, -4, and -5 relative to the month of application decision. Dots show mean of the outcome for 85 equal-frequency bins (220 applicants per bin), except for Panel H where there are 31 bins (130 applicants per bin). Solid lines show fitted values from a second-order polynomial; dashed lines show 95% confidence intervals. For each outcome, we also report the RD and IV estimates, their standard errors, and the mean of the outcome for applicants with an income of 350-450% of FPL (i.e., the "control group" mean). N = 18,672 observations.

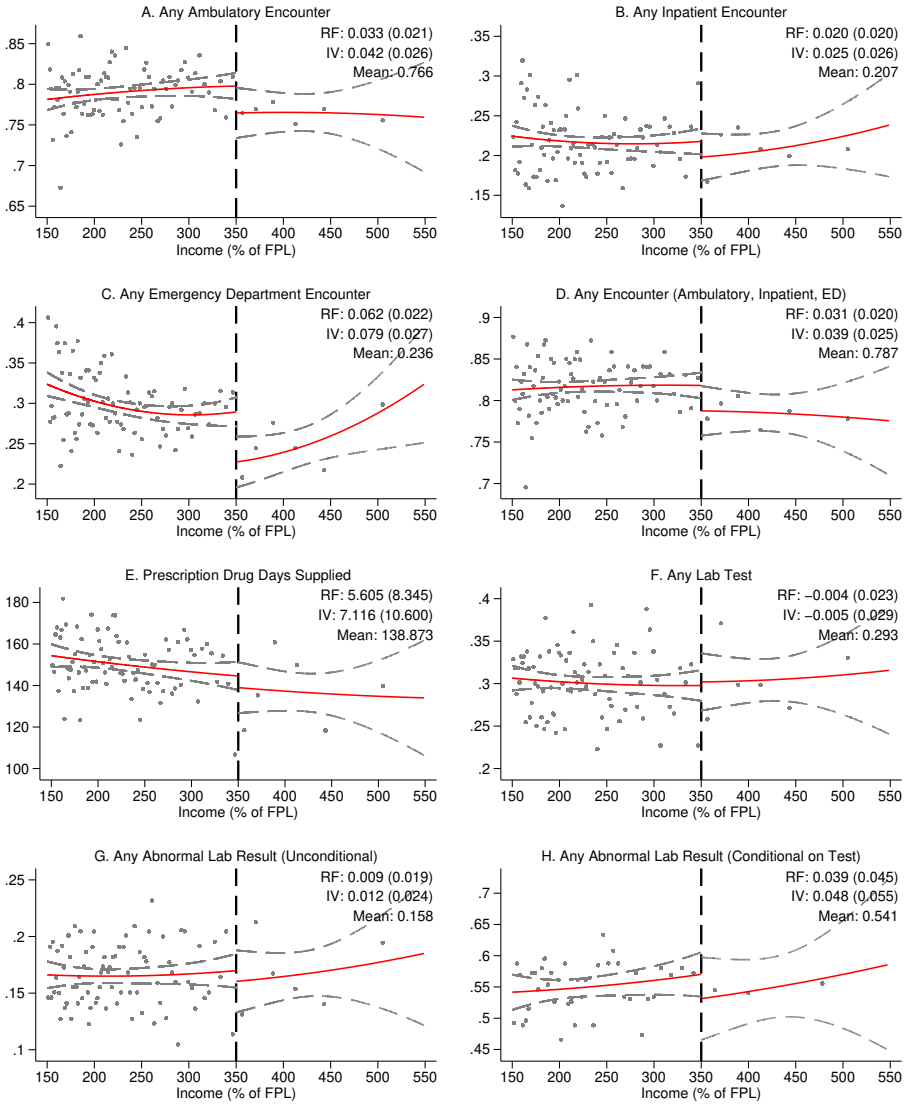

Figure A2. RD Estimates for Quarter 0

Note: Figure shows regression discontinuity plots of the impact of financial assistance in quarter 0, which corresponds to event months 0, -1, and -2 relative to the month of application decision. Dots show mean of the outcome for 85 equal-frequency bins (220 applicants per bin), except for Panel H where there are 43 bins (130 applicants per bin). Solid lines show fitted values from a second-order polynomial; dashed lines show 95% confidence intervals. For each outcome, we also report the RD and IV estimates, their standard errors, and the mean of the outcome for applicants with an income of 350-450% of FPL (i.e., the "control group" mean). N = 18,672 observations.

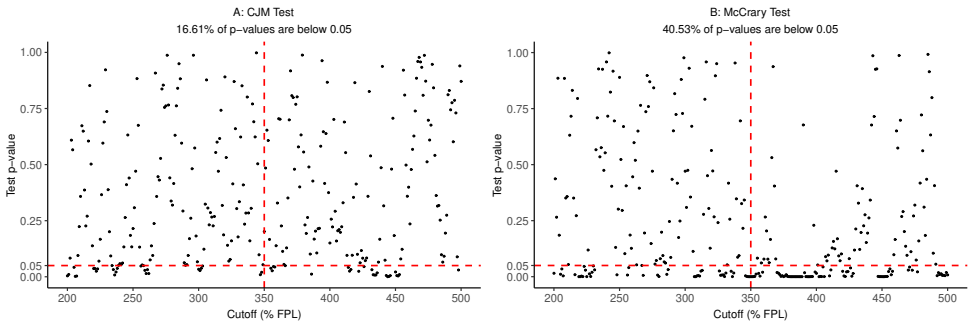

Figure A3. Distribution of P-values for Placebo Manipulation Tests

Note: Panels A shows the p-values from placebo CJM tests conducted at 1% increments for the 301 points between 200% and 500% FPL. Panels B shows the p-values from 301 placebo McCrary manipulation tests conducted at the same increments. The vertical dashed lines show the actual 350% FPL cutoff for the financial assistance program. The horizontal dashed lines show the conventional 0.05 p-value threshold for rejecting the null of no manipulation.